CLAIMS

What is claimed is:

1. A supported lattice for cultivating living cells to form living tissue, said supported lattice comprising:

a support substrate comprising a plurality of resilient filamentary members interlaced together, said resilient filamentary members being interlaced to form a relatively coarse mesh defined by relatively large interstices between said resilient filamentary members; and

a cell cultivation lattice comprising a plurality of flexible filamentary members interlaced with one another and said resilient filamentary members, said flexible filamentary members being interlaced to form a relatively fine mesh defined by relatively small interstices between said flexible filamentary members and adapted for growing cells in a two-dimensional array across said large interstices of said support substrate to form a substantially continuous surface comprising said living tissue.

2. A supported lattice according to Claim 1, wherein said support substrate comprises an elongated tube.

3. A supported lattice according to Claim 2, wherein said resilient and said flexible filamentary members are interlaced by braiding.

4. A supported lattice according to Claim 2, wherein said relatively small interstices between said

flexible filamentary members have an average size between about 60 microns and about 80 microns.

5. A supported lattice according to Claim 2, wherein said resilient filamentary members comprise monofilaments selected from the group consisting of stainless steel, nitinol and elgiloy monofilaments.

6. A supported lattice according to Claim 5, wherein said flexible filamentary members comprise multi-filament yarns.

7. A supported lattice according to Claim 6, wherein said multi-filament yarns are elastic.

8. A supported lattice according to Claim 7, wherein said multi-filament yarns comprise textured yarns.

9. A supported lattice according to Claim 8, wherein said multi-filament yarns are selected from the group consisting of polyester, polytetrafluoroethylene, polypropylene and polyethylene.

10. A supported lattice according to Claim 2, further comprising a second elongated tube positioned coaxially within said first named elongated tube, said second elongated tube comprising:

a second support substrate comprising a plurality of second resilient filamentary members interlaced together, said second resilient filamentary members being interlaced to form a relatively coarse mesh defined by relatively large interstices between said second resilient filamentary members; and

a second cell cultivation lattice comprising a plurality of second flexible filamentary members interlaced with one another and said second resilient filamentary members, said second flexible filamentary members being interlaced to form a relatively fine mesh defined by relatively small interstices between said second flexible filamentary members and adapted for growing cells in a two-dimensional array across said large interstices of said second support substrate to form a second substantially continuous surface comprising said living tissue.

11. A supported lattice according to Claim 10, wherein said interstices of said first named elongated tube have an average size between about 120 microns and about 150 microns and said interstices of said second elongated tube have an average size between about 60 microns and about 80 microns.

12. A supported lattice according to Claim 10, further comprising a plurality of elongated filamentary bonding members interlaced with said resilient filamentary members comprising one of said elongated tubes, said filamentary bonding members having a relatively low melting point and being heat fused to said resilient filamentary members comprising said tubes, thereby joining said tubes to one another.

13. A supported lattice according to Claim 3, wherein said flexible filamentary members comprise multi-filament yarns, said multi-filament yarns being in a buckled configuration inwardly and outwardly from said support substrate thereby forming dimples in said lattice, said dimples being located within said

relatively large interstices between said resilient filamentary members.

14. A supported lattice according to Claim 13, wherein filaments comprising said multi-filament yarns assume said buckled configuration independently of one another thereby forming relatively small interstices between said filaments.

15. A supported lattice according to Claim 14, wherein said resilient filamentary members comprise a heat shrinkable material having a relatively low melting point and said flexible filamentary members comprise multi-filament yarns of a dimensionally stable material having a relatively higher melting point, said resilient filamentary members being heat fused to one another and to said flexible filamentary members at points of mutual contact, thereby locking said flexible filamentary members in said buckled configuration.

16. A supported lattice according to Claim 15, wherein said resilient filamentary members comprise polypropylene and said flexible filamentary members comprise polytetrafluoroethylene.

17. A supported lattice according to Claim 2, wherein said resilient and said flexible filamentary members comprise bio-absorbable material selected from the group consisting of polylactic acid, polyglycolic acid and hydroxyacetic acid, said resilient filamentary members having a relatively larger denier than said flexible filamentary members.

18. A supported lattice according to Claim 1, wherein said resilient filamentary members comprise monofilaments selected from the group consisting of stainless steel, nitinol and elgiloy monofilaments.

19. A supported lattice according to Claim 18, wherein said flexible filamentary members comprise multi-filament yarns.

20. A method of making a supported lattice adapted for growing cells in a two-dimensional array to form a substantially continuous surface comprising living tissue, said method comprising the steps of:

braiding a plurality of resilient filamentary members into a tubular support substrate comprising a relatively coarse mesh defined by relatively large interstices between said resilient filamentary members, said resilient filamentary members comprising a heat-shrinkable material;

braiding a plurality of relatively flexible filamentary members with one another and with said resilient filamentary members to form a lattice supported on said support substrate and comprising a relatively fine mesh defined by relatively small interstices between said resilient filamentary members, said flexible filamentary members comprising a dimensionally stable material having a higher melting temperature than said heat-shrinkable material;

compressing said tubular support substrate longitudinally causing said flexible filamentary members to buckle and form dimples located within said interstices of said support substrate; and

heating said filamentary members above the melting temperature of said heat-shrink material

thereby shrinking said resilient filamentary members and fusing them together with said flexible filamentary members at mutual points of contact.

21. A method according to Claim 20, wherein said filamentary members are braided over a mandrel.

22. A method of repairing severed nerve ganglia surrounded by living tissue, said method comprising the steps of:

providing a supported lattice comprising a tubular support substrate formed from a plurality of resilient filamentary members interlaced together, said resilient filamentary members being interlaced to form a relatively coarse mesh defined by relatively large interstices between said resilient filamentary members, said supported lattice further comprising a cell cultivation lattice formed of a plurality of relatively flexible filamentary members interlaced with one another and said resilient filamentary members, said flexible filamentary members being interlaced to form a relatively fine mesh defined by relatively small interstices between said flexible filamentary members and adapted for cultivating said nerve ganglia;

implanting said tubular support substrate within said living tissue between ends of said severed nerve ganglia; and

placing said ends of said severed nerve ganglia within said tubular support substrate on said lattice, said lattice facilitating growth of said ends together while isolating said ends from said surrounding living tissue.

23. A method according to Claim 22, wherein said supported lattice comprises bio-absorbable material and said method further comprises the step of allowing said supported lattice to be absorbed by said living tissue surrounding said nerve ganglia.

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